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ABSTRACT

This paper reports research in progress. The purpose of this study was to examine the growing variety of research emerging in distance education and to suggest a method for synthesizing the results. Over 60 articles, representing both quantitative and qualitative studies published in major journals during the past two years, have been abstracted and reviewed. Preliminary research categories have been determined and a meta-analytic model has been designed to synthesize the experimental and quasi-experimental data. The remaining qualitative studies will be subjected to a heuristic analysis to present a fuller picture of methods and results of research currently being done in distance education. (7 references) (Author)

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RESEARCH IN DISTANCE EDUCATION: METHODS AND RESULTS

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ABSTRACT

This paper reports research in progress. The purpose of this study was to examine the growing variety of research emerging in Distance Education and to suggest a method for synthesizing the results. Over 60 articles, representing both quantitative and qualitative studies published in major journals during the past two years, were abstracted and reviewed. Preliminary research categories have been determined and a meta-analytic model has been designed to synthesize the experimental and quasi-experimental data. The remaining qualitative studies will be subjected to a heuristic analysis to present a fuller picture of methods and results of research currently being done in distance education.

BACKGROUND

The theory and practice of learning at a distance is not new. It is a concept which includes all forms of teaching in which the teacher and learner are separated by time and space. Correspondence study, home study and independent study were all early forms of what is referred to today as distance education. However, the past twenty years have shown unprecedented growth in the number of institutions providing distance education throughout the world. In 1971 the United Kingdom Open University, also known as the British Open University, began operation. It was quickly followed within the next ten years by Canada's Athabasca University, China's Television University, Germany's Fernuniversitat , Israel's Everyman's University, Pakistan's Allama Iqbal Open University, and Venezuela's Universidad Nacional Abierta (Rumble & Harry, 1982). The 1980s have seen the establishment of similar open university programs in Thailand, Turkey, Nigeria and many developing countries of the world (McIsaac, Murphy & Demiray, 1988). Recently, more than 700 delegates participated in the 14th World Conference of the International Council for Distance Education, held in Oslo in August 1988. During that conference, major presentations and research reports from over 50 countries were added to the growing body of research in distance education (ICDE, 1988). The increasing number of research articles arriving at the United Nations University International Documentation Centre (Harry, 1988), the recent First American Symposium on Research in Distance Education and the creation in 1987 of the American Journal of Distance Education (Moore, 1987,1988) all reflect the proliferation of documentation and research in this area.

Although research is reported in three or four major journals devoted to the literature in distance education, there has been no effort to centralize research findings. Due to the nature of the endeavor, descriptions of programs, surveys, and experimental studies may be reported at conferences, in government reports, in journals, and in newsletters. Such information is difficult to locate and interpret. This paper reports research in progress relating to one project undertaken to determine emerging research themes and to examine the body of accumulated research concerned with distance education.

A meta-analytic model was designed and a sample of 62 research studies in distance education was selected for preliminary evaluation. Meta-

analysis is a technique which quantitatively synthesizes experimental and quasi-experimental research by transforming data to standard scores and reporting effect sizes (Glass, McGaw & Smith, 1981). For this project, research studies which reported non-experimental designs were set aside to be treated descriptively in order to provide a well-rounded picture of what research is saying about distance teaching and learning. The two objectives of the study were to identify research categories which recurred in the literature and to design a model for the data analysis.

METHOD

Seven resources were manually searched for quantitative and qualitative research studies in distance education reported during the two years 1987-89. The sources included ERIC Abstracts, The International Documentation Center Abstracts, The American Journal of Distance Education, The Canadian Journal of Educational Communication, Distance Education, Educational Researcher and the International Council for Distance Education Bulletin . The searches yielded 62 empirical studies which met the criteria established. These were entered into the database. Bibliographies of the previously mentioned studies are currently being searched as well as the American Symposium on Distance Education, Dissertation Abstracts, and Developing Distance Education.

Analysis of the articles revealed two major areas of inquiry with sub-categories in each area. The two major areas were Instruction and Administration. Sub-categories under Instruction included studies which evaluated LEARNING, ATTITUDES, and ATTRITION. Sub-categories under Administration included studies of COST-EFFECTIVENESS and COURSE DESIGN. The largest category of research, LEARNING, reported performance gains, learning styles, learning format, and age and gender differences. The second area, ATTITUDES, reported attitudes and motivation of teachers and students by age and gender. The third sub-category, ATTRITION, included demographics of drop-outs or early-leavers, and provided general student characteristics. Studies under Administration reported in the areas of COST-EFFECTIVENESS, both operating and start-up costs, and COURSEWARE DESIGN, which evaluated the use of print and non-print materials for instruction. Of the 62 articles, approximately half met the criteria for meta-analysis. The remaining studies will be evaluated descriptively to provide additional substantive information about programs and course design.

The second objective of this pilot phase of the project was to design the database and apply a meta-analytic model to one of the identified research categories. In the future, data will be collected and meta-analyses applied to the other identified research areas.

ANALYSIS

The accumulation of research in education offers a challenge to the researcher to synthesize and interpret conflicting results. The systematic approach offered by meta-analysis has been popularized by Glass et al. (1981) and offers a systematic and rigorous approach to standardizing research findings. The recent development of Apple™ Computers' program Hypercard™

offers a user friendly database for conducting the analysis. In this case, the program Hypercard™ was used to automate many of the routine features of the meta-analysis. Hypercard ™ serves three key features in this analysis. First, it provides the format for a database of the surveyed articles. This includes important citation information such as author, title, journal and publisher as well as subject descriptors. Second, each reference is connected to an abstract. Third, each reference is also tied to a stack in which results of the study are reported. Stacks, or series of cards, are being developed to standardize the input of research to allow the researchers to view a concise, clearly articulated summary of the research findings. A complete automation of the computations required to standardize scores for the meta-analysis is currently being developed as an integral part of the results stack.

The type of organization offered by Hypercard™ has many advantages for the researcher. By organizing the studies into information fields, i.e., author, title, etc., it is possible to search or sort by key categories. Easy search of key words is possible within any of the fields, the abstract, or the results. These features can become powerful tools for the scholar.

In the next step, conducting the meta-analysis, the following procedures are used. First, samples are drawn from the available population. The list of sources appears above. Second, information is coded to identify the research categories listed above. Third, statistical computations must be applied to standardize scores and make meaningful comparisons. Results of each study in the form of T- tests, F- tests, Chi Square, correlations and analysis of variance are weighted according to their effect sizes and whether they are truly experimental, quasi-experimental or uncontrolled. The transformation of these statistics results in a common unit or Product Moment Correlation which measures the significance of the research. A correlation of .5 or above and statistical significance of less than .05 is expected if the intervention is to be considered successful. To date, research categories have been determined and the Hypercard™ meta-analytic model designed. The next step is to perform the analysis on the first category, learning.

SUMMARY

This study reports research in progress and the completion of two steps in the synthesis of current distance education research. First, as a result of a review of 62 studies, five research categories were identified as occurring most frequently in current distance education literature. These categories fall under the broad headings of instruction and administration. Next, a model for synthesizing the large volume of recent research was developed using Glass et al.'s (1981) meta-analytic procedures. The model was designed using Hypercard™ as a database to create stacks and link information essential for performing the statistical transformations of data required for a quantitative meta-analysis. The first and largest category of research to be analyzed is that dealing with learning. Meta-analyses of research on attitude and attrition will follow. Descriptive studies of course development and cost-effectiveness will be analyzed qualitatively.

Meta-analysis offers a systematic way to synthesize research in this rapidly growing area of distance education. The development of a Hypercard™ database facilitates data entry and subsequent transformations. It is hoped that the resulting quantitative synthesis of research, identifying which interventions are successful, will provide international distance educators with the necessary information to assist them in developing new strategies for their own programs.

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